

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

18 October 1999 (18.10.99)

International application No.

PCT/GB99/00522

Applicant's or agent's file reference

IHWD/P20451PC

International filing date (day/month/year)

19 February 1999 (19.02.99)

Priority date (day/month/year)

20 February 1998 (20.02.98)

Applicant

SHUKER, John

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

17 September 1999 (17.09.99)



in a notice effecting later election filed with the International Bureau on:

2. The election



was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

C. Carrié

Telephone No.: (41-22) 338.83.38

A HINGE ASSEMBLY

The present invention relates to a hinge assembly incorporating a check mechanism. The hinge assembly is particularly, but not exclusively, suitable for use as a vehicle door hinge.

A vehicle is normally provided with a door check mechanism which operates on the door to releasably hold the door in an open position. This is desirable to resist premature closing of a door when a person is entering or leaving a vehicle.

It is known to provide door check mechanisms which are separate from the door hinge assemblies which hingedly connect the door to the vehicle body. Although this type of door check mechanism works well, they are undesirable as they require separate assembly when mounting the door onto the vehicle body.

Door hinges are known which incorporate door check mechanisms. Such door hinges tends to be bulky in size and cannot therefore be fitted to vehicles where there are space constraints.

A general aim of the present invention is to provide a hinge assembly incorporating a door check mechanism which is compact in size.

According to one aspect of the present invention there is provided a hinge assembly including a first hinge leaf hingedly connected to a second hinge leaf by a hinge pin, the hinge pin being rotatably mounted

in one hinge leaf and non-rotatably mounted in the other hinge leaf, and a check mechanism operably connected to the hinge pin and said one hinge leaf to releasably hold the first and second hinge leaves at at least one angular position about the hinge axis, the check mechanism including check means resiliently biased in a radial direction relative to the hinge axis and into contact with an annular cam track formed on a reaction member, the check means being driven along said annular cam track by relative rotation between said first and second hinge leafs, the cam track including at desired locations therealong one or more check formations which co-operate with said check means to releasably retain the first and second hinge leafs at a desired angular position relative to one another.

Preferably the check means includes a check body rotatably located within said annular track, the check body including two or more check members which are biased in a radial outward direction to engage and run along said cam track.

Preferably the check formations are in the form of recesses spaced along the cam track into which the check members are received in order to releasably retain the hinge leafs at a desired angular position relative to one another.

Advantageously, the check members are in the form of balls.

Various aspects of the present invention are hereinafter described with reference to the accompanying drawings, in which:-

Figure 1 is an exploded schematic view of a hinge assembly according to one embodiment of the present invention;

Figure 2 is an axial section through part of the hinge assembly of Figure 1;

Figure 3 is a sectional view taken along line III-III in Figure 2; and

Figure 4 is an axial section similar to Figure 2 showing another embodiment according to the present invention.

There is shown in the drawings a hinge assembly 10 including a first hinge leaf 11 which is pivotally connected to a second hinge leaf 12 by a hinge pin 14.

The hinge pin 14 is fixedly secured to hinge leaf 11 so as not to be rotatable relative thereto. Typically the hinge pin 14 is made of a suitable hard wearing steel and hinge leaf 11 may be formed from a metal pressing or forged or cast metal.

The hinge pin 14 projects axially from hinge leaf 11 to be rotatably received within hinge leaf 12. Preferably bushes (not shown) may be provided for rotatably supporting the hinge pin within the hinge leaf 12.

As more clearly seen in Figure 2, the hinge pin 14 projects axially beyond hinge leaf 12 to be received within a check mechanism 30.

The check mechanism 30 includes a check body 31 containing check members 32 which are biased radially outwardly into contact with a surrounding check reaction member 33.

The check body 31 is fixedly secured to the hinge pin 14 so as to be non-rotatable relative thereto and the check reaction member 33 is fixedly secured to the hinge leaf 12 so as to be non-rotatable relative thereto. Accordingly rotation of hinge leafs 11, 12 relative to one another causes check body 31 to rotate relative to check reaction member 33.

The check reaction member 33 has inner annular face 34 which defines a cam track about which check members 32 run on rotation of the check body 31 relative to the check reaction member 33.

Preferably the check members 32 are in the form of balls, preferably made from a hard wearing material such as steel.

Each check member 32 is located in a radially extending bore 35 formed in the body 31 and is biased into contact with the cam track by resilient means preferably in the form of a resilient spring 36. Other forms of resilient means may be used if desired, for example a block of resiliently deformable material may be used.

The angular spacing of bores 35 about the axis of rotation of the hinge pin 14 is preferably chosen such that radially inwardly directed loadings applied by the check members 32 is balanced and equally distributed about the axis of rotation.

The number of check members 32 in the illustrated embodiment is three; however, it will be appreciated that more or less than three check members 32 may be provided: it being preferable to have at least two in order to enable radially inwardly directed loadings to be balanced.

In order to provide checked angular positions at which the hinge leafs 11, 12 are releasably held at desired relative angular positions, check recesses 38 are provided within the cam track.

The recesses 38 are preferably arranged in a group in which the recesses of the group correspond in number and spacing to the check members 32 so that at a desired checked angular position all check members 32 enter a corresponding recess 38 of the group. Accordingly all check members 32 simultaneously act to resist rotation of the hinge leafs from the checked position and so thereby enable a high check force to be generated.

It will be appreciated that more than one checked angular position may be provided by providing additional groups of recesses 38 which are spaced from one another along the cam track.

Preferably the check reactive member 33 is in the form of an annulus which is preferably formed from a sintered metal.

The reactive member 33 is preferably non-rotatably mounted within a housing 40 which is fixedly secured to the hinge leaf 12. The housing 40 is preferably a metal pressing.

Preferably the housing 40 has an open top which is closed by an end cap 41. Preferably the end cap 41 is also a metal pressing and is preferably fixedly secured to the housing 40 after assembly of the check mechanism.

The end cap 41 is preferably provided with a central opening housing a bush 44 in which the hinge pin 14 is rotatably mounted. With such an arrangement, the hinge pin 14 is positively rotatably mounted at two axial positions located on opposite axial sides of the check body 31.

A second embodiment 60 is illustrated in Figure 4 wherein parts similar to those found in the first embodiment 10 are designated by the same reference numerals.

The hinge assembly of the second embodiment is adapted so as to provide a hinge assembly having a lift-off facility.

In this respect, hinge pin 14 is arranged to pass directly into the check mechanism 30 from hinge leaf 11. The hinge pin 14 is provided with an extension portion 14a which projects axially beyond the check mechanism 30 to be axially received in hinge leaf 12. The pin portion 14a is preferably axially slidably received within hinge leaf 12 but is non-rotatable therein. Accordingly relative rotation between hinges 11 and 12 causes the hinge pin 14 to rotate within hinge leaf 11.

Since hinge pin 14 is axially slidably received in the hinge leaf 12, it is possible to separate hinge leaves 11, 12 by axial displacement therebetween.

In normal use, such axial separation of the hinge leaves 11, 12 is prevented, for example by removable retention means 61 such as a clip or threaded nut on the pin portion 14a, or by weight of the door which is hingedly supported by the hinge assembly 60.

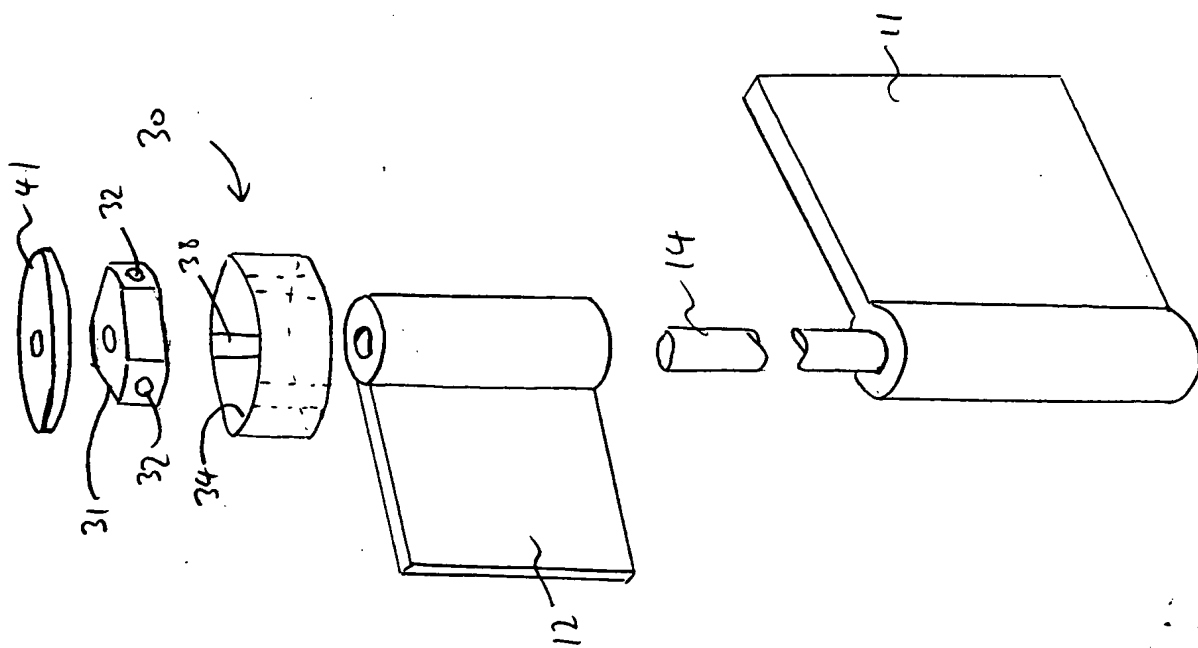


FIG 1

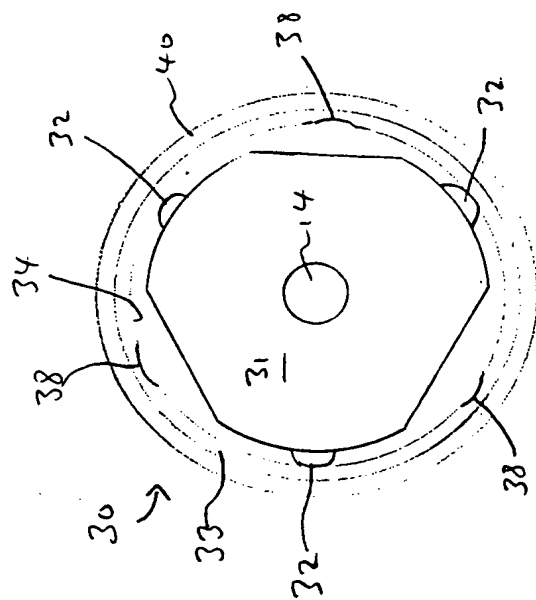


FIG 3

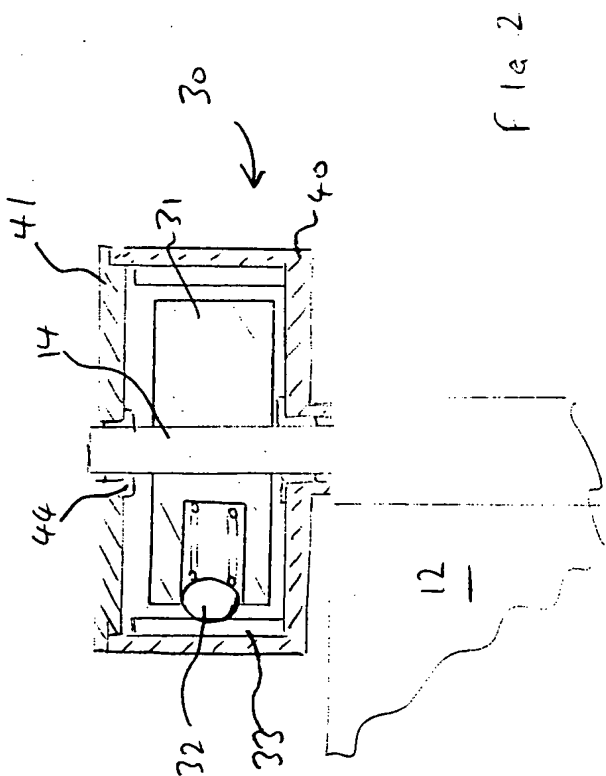


FIG 2

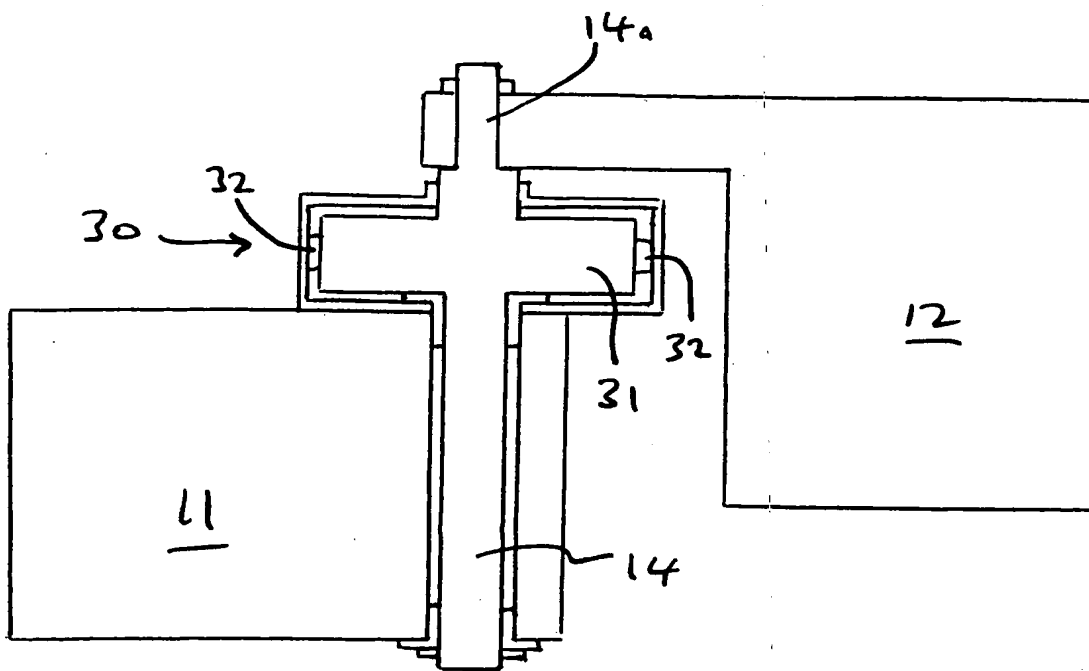


FIG 4

CLAIMS

1. A hinge assembly including a hinge assembly including a first hinge leaf hingedly connected to a second hinge leaf by a hinge pin, the hinge pin being rotatably mounted in one hinge leaf and non-rotatably mounted in the other hinge leaf, and a check mechanism operably connected to the hinge pin and said one hinge leaf to releasably hold the first and second hinge leaves at at least one angular position about the hinge axis, the check mechanism including check means resiliently biased in a radial direction relative to the hinge axis and into contact with an annular cam track formed on a reaction member, the check means being driven along said annular cam track by relative rotation between said first and second hinge leafs, the cam track including at desired locations therealong one or more check formations which co-operate with said check means to releasably retain the first and second hinge leafs at a desired angular position relative to one another.

2. A hinge assembly according to Claim 1 wherein the check means includes a check body rotatably located within said annular track, the check body including two or more check members which are spaced from one another circumferentially about the hinge axis, the check member being biased in a radial outward direction to engage and run along said cam track.

3. A hinge assembly according to Claim 2 wherein the check formations are in the form of recesses spaced along the cam track into which the check members are received in order to releasably retain the hinge leafs at a desired angular position relative to one another.

4. A hinge assembly according to Claim 3 wherein the recesses are arranged in one or more groups corresponding to respective check positions, the recesses in each group corresponding in number and circumferential spacing to the number and circumferential spacing of the check members such that at a desired check position all check members are located in a corresponding recess of the group.

5. A hinge assembly according to Claim 2, 3 or 4 wherein the check members are in the form of balls.

6. A hinge assembly according to Claim 5 wherein each ball is located in a radially extending bore formed in the check body in which is housed resilient means for biasing the ball radially outwardly.

7. A hinge assembly according to any preceding claim wherein the reaction member is non-rotatably located in a housing fixedly secured to said one hinge leaf.

8. A hinge assembly according to Claim 7 wherein the reaction member is in the form of an annulus, preferably formed from sintered metal, and the housing is preferably formed as a metal pressing.

9. A hinge assembly according to Claim 7 or 8 wherein the housing has a bottom wall and an open top closed by an end cap, the check body being located inbetween the bottom wall and end cap and the hinge pin being rotatably supported in said bottom wall and end cap.

10. A hinge assembly according to any preceding claim wherein said other hinge leaf is axially withdrawable from the hinge pin so as to define a lift-off hinge assembly.

11. A hinge assembly substantially as herein described with reference to and as illustrated in the accompanying drawings.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IHWD/P20451PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/00522	International filing date (day/month/year) 19/02/1999	Priority date (day/month/year) 20/02/1998
International Patent Classification (IPC) or national classification and IPC E05D11/10		
Applicant UPF (UK) LIMITED et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- | | |
|------|---|
| I | <input checked="" type="checkbox"/> Basis of the report |
| II | <input type="checkbox"/> Priority |
| III | <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| IV | <input type="checkbox"/> Lack of unity of invention |
| V | <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| VI | <input type="checkbox"/> Certain documents cited |
| VII | <input checked="" type="checkbox"/> Certain defects in the international application |
| VIII | <input checked="" type="checkbox"/> Certain observations on the international application |

Date of submission of the demand 17/09/1999	Date of completion of this report 19.05.00
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Fuchs, A Telephone No. +49 89 2399 2987 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/00522

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-7 as originally filed

Claims, No.:

1-8 with telefax of 12/04/2000

Drawings, sheets:

1/2,2/2 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☒ the claims, Nos.: 9-11
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 8.

because:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/00522

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 8 are so unclear that no meaningful opinion could be formed (*specify*):
- see separate sheet**
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/00522

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

No opinion can be established for claim 8, for the reasons given in point VIII.

Re Item VIII

Certain observations on the international application

Claim 8 does not meet the requirements of article 6 PCT, because its subject-matter of is unclear (rule 6.2 a).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Following documents are cited in the present preliminary report :

- DE-U-29114386 (=D1)
- DE-A-3137134 (=D2)

1. **Claim 1**

1.1 The following features are known from the prior art and are disclosed in combination in D1 Fig. 1 :

a hinge assembly including a first hinge leaf 4 hingedly connected to a second hinge leaf 2 by a hinge pin 5, the hinge pin 5 being rotatably mounted in one hinge leaf 2 (page 11 lines 26-28) and non-rotatably mounted in the other hinge leaf 4 (page 11 line 28 - page 12 line 2), and a check mechanism (Türfeststeller) operably connected to the hinge pin 5 (page 13 lines 17-20) and said one hinge leaf 2 (page 12 lines 21-24) to releasably hold the first and second hinge leave at at least one angular position about the hinge axis (page 7 lines 10-16), the check mechanism including a check body 24 rotatably located within an annular cam track 20 (Fig. 29, the check body including check members 21 which are spaced from

one another circumferentially about the hinge axis (Fig. 2), the check members 21 being resiliently biased in a radial outward direction relative to the hinge axis (page 8 lines 10-15) to engage and run along said cam track 20, the check members 21 being driven along said annular cam track 20 by relative rotation between said first 4 and second 2 hinge leafs, the cam track 20 including at desired locations (page 10 lines 20-26) there along one or more check formation 19 which cooperate with said check members 21 to releasably retain the first 4 and second 2 hinge leafs at a desired angular position relative to one another, the cam track 20 being formed on a reaction member 16.

The subject-matter of claim 1 differs from that of D1, considered to represent the closest prior art, by that the reaction member and the housing are two different elements, formed of different materials (respectively sintered metal and metal pressing), the reaction member being non-rotatably located in the housing. The subject-matter of claim 1 is therefore novel, in the sense of article 33 (2) PCT, as compared to D1.

- 1.2 The use of a separate element for the reaction member, composed of a different material, is disclosed in D2 (page 15 lines 9-13), and the advantages with regard to specific hardness, interchangeability,... are obvious. Although the characteristics of sintered metal are known to the skilled person (hardened surface and porosity which assists in the retention of lubricants), the use of sintered metal according to the present invention, i.e. the reaction member *being formed* by that metal, is nevertheless neither disclosed, nor suggested in the available prior art. The subject-matter of claim 1 would therefore involve an inventive step in the sense of article 33 (3) PCT, and claim 1 fulfill the requirements of article 33 (1) PCT.

2. Dependent claims 2 to 8

- 2.1 Claims 2 to 7 are dependent from claim 1 and would therefore also meet the requirements of the PCT.
- 2.2 For claim 8, see point VIII.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/00522

Re Item VII

Certain defects in the international application

1. D1 should be cited and briefly disclosed in the description according to rule 5.1 a) PCT.
2. Independent claim 1 is not in the two-part form according to rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in a preamble (rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (rule 6.3(b)(ii) PCT).
3. According to the requirements of Rule 10.2 PCT, the terminology and the signs shall be consistent throughout the application. This requirement is not met in view of the use of the expressions "check members" and "check means" for the same feature (see claim 1).
4. The features of the claims are not provided with reference signs placed in parentheses (rule 6.2(b) PCT).

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 99/00522

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E05D11/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 296 14 386 U (ED. SCHARWÄCHTER) 24 October 1996	1-4, 7, 8, 10, 11
Y	see page 11, line 22 - page 13, line 28; figures 1, 2	5, 6, 9
X	FR 2 670 530 A (COUTIER MOULAGE GEN IND) 19 June 1992 see page 6, line 8 - page 7, line 3 see page 7, line 36 - page 8, line 3 see page 8, line 5 - line 32; figures 1-12	1-4, 7-11
Y	DE 31 37 134 A (FRIEDR. FINGSCHIEDT) 1 July 1982 see page 9, line 32 - line 37 see page 11, line 4 - line 14; figures 3, 6, 7	5, 6

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

11 May 1999

Date of mailing of the international search report

21/05/1999

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Guillaume, G

INTERNATIONAL SEARCH REPORT

Intern al Application No
PCT/GB 99/00522

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FR 2 705 389 A (COUTIER MOULAGE GEN IND) 25 November 1994 see page 5, line 27 - line 33; figure 2 -----	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/00522

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29614386 U	24-10-1996	NONE	
FR 2670530 A	19-06-1992	NONE	
DE 3137134 A	01-07-1982	FR 2495212 A JP 57119075 A	04-06-1982 24-07-1982
FR 2705389 A	25-11-1994	NONE	

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference IHWD/P20451PC	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 00522	International filing date (day/month/year) 19/02/1999	(Earliest) Priority Date (day/month/year) 20/02/1998
Applicant UPF (UK) LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 99/ 00522

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A hinge assembly including a first hinge leaf hingedly connected to a second hinge leaf by a hinge pin (14), the hinge pin (14) being rotatably mounted in one hinge leaf (12) non-rotatably mounted in the other hinge leaf (11), and a check mechanism (30) operably connected to the hinge pin (14) and said one hinge leaf (12) to releasably hold the first and second hinge leaves (11,12) at at least one angular position about the hinge axis, the check mechanism (30) including check means (32) resiliently biased in a radial direction relative to the hinge axis and into contact with an annular cam track (34) formed on a reaction member (33), the check means (32) being driven along said annular cam (34) by relative rotation between said first and second hinge leaves (11,12), the cam track (34) including at desired locations therealong one or more check formations (38) which cooperate with said check means (32) to releasably retain the first and second hinge leaves (11,12) at a desired angular position relative to one another.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/00522

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 E05D11/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 296 14 386 U (ED. SCHARWÄCHTER) 24 October 1996	1-4,7,8, 10,11
Y	see page 11, line 22 - page 13, line 28; figures 1,2	5,6,9
X	FR 2 670 530 A (COUTIER MOULAGE GEN IND) 19 June 1992 see page 6, line 8 - page 7, line 3 see page 7, line 36 - page 8, line 3 see page 8, line 5 - line 32; figures 1-12	1-4,7-11
Y	DE 31 37 134 A (FRIEDR. FINGSCHEIDT) 1 July 1982 see page 9, line 32 - line 37 see page 11, line 4 - line 14; figures 3,6,7	5,6
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

11 May 1999

Date of mailing of the international search report

21/05/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
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International Application No

PCT/GB 99/00522

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